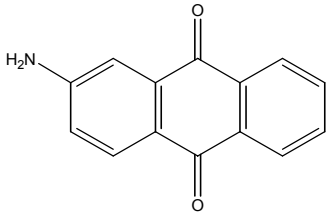
2-AMINOANTHRAQUINONE
CAS No. 117-79-3
First Listed in the *Third Annual Report on Carcinogens*



CARCINOGENICITY

2-Aminoanthraquinone is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (NCI 144, 1978). When administered in the diet, 2-aminoanthraquinone increased the incidences of hepatocellular carcinomas and neoplastic nodules in male rats, hepatocellular carcinomas in mice of both sexes, and lymphomas in female mice. An IARC Working Group considered that the evidence for the carcinogenicity of 2-aminoanthraquinone in experimental animals was limited (IARC V.27, 1982; IARC S.7, 1987). In view of a NCI/OTA correlative interpretation, the evidence may be regarded as sufficient (Griesemer and Cueto, 1980; OTA, 1981).

There are no adequate data available to evaluate the carcinogenicity of 2-aminoanthraquinone in humans (IARC V.27, 1982; IARC S.7, 1987).

PROPERTIES

2-Aminoanthraquinone occurs as orange-brown-to-red needles with a melting point of 303 ^{o}C. It is insoluble in water and diethyl ether; slightly soluble in alcohol; and soluble in acetone, benzene, and chloroform. When heated to decomposition, it emits toxic fumes of nitrogen oxides (NO_x).

USE

2-Aminoanthraquinone is used as an intermediate in the industrial synthesis of anthraquinone dyes. It is the precursor of five dyes and one pigment: Colour Index Vat Blues 4, 6, 12, and 24; Vat Yellow 1; and Pigment Blue 22 (NCI 144, 1978). These dyes are used in automotive paints, high-quality paints and enamels, plastics, rubber, printing inks, and as textile dyes (Gosselin et al., 1976; Sax, 1977). It is also used as a pharmaceutical intermediate (HSDB, 1997).

PRODUCTION

2-Aminoanthraquinone was first produced commercially in the United States in 1921 (IARC V.27, 1982). Recent production figures for 2-aminoanthraquinone are considered proprietary and are not available. The 1998 *Chemical Buyers Directory* identifies two suppliers of the compound (Tilton, 1997). Although not listed in the 1997 *Directory of Chemical*

Producers, the 1985 edition listed one U.S. producer of 2-aminoanthraquinone and its salt (SRIa, 1997, 1986). Production by this firm was believed to be for captive consumption. In 1980, NCI data indicated that imports of the chemical through principal U.S. customs districts amounted to only 250 lb, whereas imports through the principal U.S. customs districts in 1979 totaled over 100,000 lb (IARC V.27, 1982). The 1979 TSCA Inventory identified two producers (no volume reported) and three importers (no volume reported) in 1977, with site limitations; the CBI Aggregate was less than 1 million lb (TSCA, 1979). Production volumes for 2-aminoanthraquinone have not been reported by the USITC since 1979 (USITC, 1980-1994), but EPA reported five producers and importers of the chemical between 1975 and 1977 (SRIa, 1986).

EXPOSURE

The primary routes of potential human exposure to 2-aminoanthraquinone are inhalation and dermal contact. Potential consumer exposure to anthraquinone may occur through contact with products containing residues of anthraquinone dyes. CPSC reported that trace amounts of unreacted 2-aminoanthraquinone may be present in some dyes as well as in the final consumer products, and exposure to trace amounts may be a cause for concern. Data are not available on the actual levels of impurities in the final products, the potential for consumer exposure, or the potential for human uptake. Because the chemical is used on a commercial scale solely by the dye industry, the potential for occupational exposure to the compound is greatest for workers at dye manufacturing facilities. No data are available on the number of facilities using 2-aminoanthraquinone. The National Occupational Hazard Survey, conducted by NIOSH from 1972 to 1974, made no estimate of the potential occupational exposure to 2-aminoanthraquinone alone, but estimated that 6,400 workers have possibly been exposed to anthraquinone dyes (NIOSH, 1976).

REGULATIONS

EPA has proposed regulating 2-aminoanthraquinone under the Resource Conservation and Recovery Act (RCRA), subjecting it to reporting requirements. EPA regulates 2-aminoanthraquinone under the Superfund Amendments and Reauthorization Act (SARA), subjecting it to reporting requirements. OSHA regulates 2-aminoanthraquinone as a chemical hazard in laboratories under the Hazard Communication Standard. Regulations are summarized in Volume II, Table B-6.